

"FEE ADDRESS" INDICATION FORM

To: MAIL STOP: M Fee Correspondence
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Please recognize as the "Fee Address," under the provisions of 37 CFR 1.363, the following address:


COMPUTER PATENT ANNUITIES, INC.
225 Reinekers Lane
Suite 400
Alexandria, VA 22314

Payor Number: 000197

in the following listed application(s) or patent(s) for which the issue fee has been paid.

| <u>Patent No.</u> | <u>Serial No.</u> | <u>Patent Date</u> | <u>US Filing Date</u> | <u>Confirmation No.</u> | <u>Attorney Docket No.</u> |
|-------------------|-------------------|--------------------|-----------------------|-------------------------|----------------------------|
| 7,535,448 B2 | 10/072,171 | May 19, 2009 | February 7, 2002 | 1313 | 0553-0302 |

Respectfully Submitted,



Mark J. Murphy
Registration No. 34,225
Date: June 26, 2009

COOK ALEX Ltd.
200 West Adams Street
Suite 2850
Chicago, Illinois 60606
(312) 236-8500

Customer No: 26568



US007535448B2

(12) **United States Patent**
Hiroki

(10) **Patent No.:** **US 7,535,448 B2**
(45) **Date of Patent:** **May 19, 2009**

(54) **LIQUID CRYSTAL DISPLAY DEVICE, AND
METHOD OF DRIVING THE SAME**

(75) **Inventor:** **Masaaki Hiroki, Kanagawa (JP)**

(73) **Assignee:** **Semiconductor Energy Laboratory
Co., Ltd. (JP)**

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 108 days.

(21) **Appl. No.:** **10/072,171**

(22) **Filed:** **Feb. 7, 2002**

(65) **Prior Publication Data**

US 2002/0109659 A1 Aug. 15, 2002

(30) **Foreign Application Priority Data**

Feb. 8, 2001 (JP) 2001-032543

(51) **Int. Cl.**
G09G 3/36 (2006.01)
G09G 5/10 (2006.01)

(52) **U.S. Cl.** **345/89; 345/690**

(58) **Field of Classification Search** **345/89,**
345/690, 691, 94, 95, 100, 206, 99
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | |
|-------------|---------|---------------------|---------|
| 4,776,676 A | 10/1988 | Inoue et al. | 350/350 |
| 4,840,462 A | 6/1989 | Hartmann | 350/350 |
| 4,976,515 A | 12/1990 | Hartmann | 350/333 |
| 5,214,523 A | 5/1993 | Nito et al. | |
| 5,349,367 A | 9/1994 | Wakita | 345/97 |
| 5,400,048 A | 3/1995 | Shimada et al. | 345/97 |

| | | | |
|---------------|---------|-------------------------|---------|
| 5,471,229 A | 11/1995 | Okada et al. | |
| 5,594,569 A | 1/1997 | Konuma et al. | 349/122 |
| 5,598,284 A | 1/1997 | Kogushi et al. | |
| 5,615,027 A | 3/1997 | Kuribayashi et al. | 345/87 |
| 5,617,229 A | 4/1997 | Yamamoto et al. | |
| 5,643,826 A | 7/1997 | Ohtani et al. | 437/88 |
| 5,657,038 A | 8/1997 | Okada et al. | 345/94 |
| 5,796,380 A | 8/1998 | Kurematsu | 345/96 |
| 5,847,799 A | 12/1998 | Tanaka et al. | 349/174 |
| 5,877,738 A * | 3/1999 | Ito et al. | 345/94 |
| 5,923,962 A | 7/1999 | Ohtani et al. | 438/150 |
| 5,953,002 A * | 9/1999 | Hirai et al. | 345/204 |
| 6,046,790 A | 4/2000 | Hara et al. | 349/172 |
| 6,057,824 A * | 5/2000 | Katakura et al. | 345/100 |

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 816 907 1/1998

(Continued)

OTHER PUBLICATIONS

Pending U.S. Appl. No. 09/570,698 to Yamazaki et al filed May 12, 2000, including specification, claims, abstract, drawings and PTO filing receipt.

(Continued)

Primary Examiner—Kevin M Nguyen
(74) *Attorney, Agent, or Firm*—Cook Alex Ltd.

(57) **ABSTRACT**

In driving a liquid crystal display device, respective voltages of picture signals supplied in subframe periods are changed so as to enlarge a voltage difference between a gradation voltage of a picture signal supplied in the first subframe period and a gradation voltage of a picture signal supplied in the second subframe period.

22 Claims, 12 Drawing Sheets

